

| Department of Chemical Engineering | | | |
|--|--|--------------------------------|---------------------|
| Separation Processes (64566) | | | |
| Total Credits | 3 | | |
| major elective | | | |
| Prerequisites | - | | |
| Course Contents | | | |
| This course provides the student with information on separation processes that are not normally covered in the unit operation and mass transfer courses. It mainly focuses on the membrane separation process principles and applications. Separation of solid materials processes such as filtration will be also covered | | | |
| Intended Learning Outcomes (ILO's) | | Student Outcomes (SO's) | Contribution |
| 1 | Recognize the basics of different membrane separation processes applied in chemical industry. | A C E H | 20 % |
| 2 | Calculate the mass transfer rates of relevant components through different types of membranes. | A E | 20 % |
| 3 | Design membrane separation process. | C G I J | 25 % |
| 4 | Apply the fundamentals of filtration processes to calculate the pressure drop and filter medium resistance for different types of filters. | C E J | 35 % |
| Textbook and/ or References | | | |
| J. D. Seader and E. J. Henley, Separation process principles, 2nd edition. John Wiley & Sons. | | | |
| Assessment Criteria | | Percent (%) | |
| First Exam | | 25 % | |
| Homeworks | | 10 % | |
| Projects | | 25 % | |
| Final Exam | | 40 % | |
| Course Plan | | | |
| Week | Topic | | |
| 1 | Types of membranes including porous and dense polymeric and inorganic membranes. | | |
| 2-3 | Mass transfer through porous and dense membranes. | | |
| 4-6 | Membrane separation processes: dialysis, electrodialysis and reverse osmosis. | | |
| 6 | First exam | | |
| 7-9 | Membrane separation processes: gas permeation, pervaporation and ultrafiltration | | |
| 10-11 | Project discussions and evaluations | | |
| 12-15 | Filtration processes and applications | | |
| 16 | Final exam | | |